

IN THE CLAIMS

This listing of claims replaces all prior listings and versions of the claims in the present application.

Listing of Claims

Claim 1 (Original): A surgical device, comprising:

a handle configured to be gripped;

a cannula connected to the handle; and

a sealing member disposed in an interior of the handle and configured to form a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising:

a seal ring connected to the interior of the handle; and

a conical section configured to have the instrument disposed therein, the conical section being connected to the seal ring and having a height at least as large as a diameter of a base of the conical section before disposing the instrument therein.

Claim 2 (Original): The surgical device according to claim 2, wherein the conical section comprises an elastic material.

Claim 3 (Original): The surgical device according to claim 2, wherein the elastic material comprises one of silicone rubber and latex.

Claim 4 (Original): The surgical device according to claim 1, wherein the conical section comprises a first portion having a first diameter disposed adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed opposite the

first portion, and wherein the height of the conical section is at least as large as the first diameter before disposing the instrument in the conical seal.

Claim 5 (Original): The surgical device according to claim 4, wherein the height of the conical section is larger than the first diameter before disposing the instrument in the conical section.

Claim 6 (Original): The surgical device according to claim 1, wherein the height of the conical section is larger than the diameter of the base of the conical section before disposing the instrument in the conical section.

Claim 7 (Original): The surgical device according to claim 6, wherein the conical section comprises a first portion having a first diameter adjacent the seal ring and a second portion having a second diameter less than the first diameter opposite the first portion, and wherein the height of the conical section is larger than the first diameter before disposing the instrument in the conical section.

Claim 8 (Original): The surgical device according to claim 7, wherein the conical section is configured to be everted when the instrument is moved in an axial direction.

Claim 9 (Original): The surgical device according to claim 1, further comprising:
an instrument removably disposed in the conical section, the conical section forming the gas tight seal with the instrument.

Claim 10 (Original): The surgical device according to claim 9, wherein the instrument comprises a penetrator.

Claim 11 (Original): A surgical device, comprising:
a handle configured to be gripped;
a cannula connected to the handle; and
a sealing member disposed in an interior of the handle and configured to form a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising:

a seal ring connected to the interior of the handle;
a conical section configured to have the instrument disposed therein, the conical section connected to the seal ring; and
first and second elastic protrusions connected to said conical section and configured to have the instrument disposed therein, the elastic protrusions configured to contact one another to form the gas tight seal.

Claim 12 (Original): The surgical device according to claim 11, wherein one of the conical section and the protrusions comprises an elastic material.

Claim 13 (Original): The surgical device according to claim 12, wherein the elastic material comprises one of silicone rubber and latex.

Claim 14 (Original): The surgical device according to claim 11, wherein the first and second protrusions comprise flaps.

Claim 15 (Original): The surgical device according to claim 14, wherein the flaps are stretched and connected to an interior of one of the cannula and the handle, such that the flaps are urged toward one another.

Claim 16 (Original): The surgical device according to claim 11, wherein the first and second protrusions comprises flat flaps configured to form the gas tight seal with the instrument when the instrument is disposed in the sealing member and configured to form the gas tight seal with one another when an instrument is not disposed in the sealing member.

Claim 17 (Original): The surgical device according to claim 11, wherein the sealing member comprises a neck disposed between the conical section and the protrusions, the neck configured to form the gas tight seal with the instrument disposed in the sealing member.

Claim 18 (Original): The surgical device according to claim 17, wherein the neck is configured to form the gas tight seal with the instrument having a diameter of between about 3 mm and about 12 mm disposed in the sealing member.

Claim 19 (Original): The surgical device according to claim 17, wherein the conical section comprises a first portion having a first diameter disposed adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed adjacent the neck.

Claim 20 (Original): The surgical device according to claim 11, wherein the protrusions define voids, and one of the cannula and the handle comprises attachment portion connecting with the voids of the protrusions.

Claim 21 (Original): The surgical device according to claim 11, further comprising:
an instrument removably disposed in the sealing member.

Claim 22 (Original): The surgical device according to claim 21, wherein the
instrument comprises a penetrator.

Claim 23 (Original): A sealing member configured to form a gas tight seal with an
instrument removably disposed in a surgical device, the sealing member comprising:
a seal ring configured to be connected to the interior of the surgical device; and
a conical section connected to the seal ring and having a height at least as large as a
diameter of a base of the conical section before the instrument is disposed in the seal.

Claim 24 (Original): The sealing member according to claim 23, wherein the conical
section comprises an elastic material.

Claim 25 (Original): The sealing member according to claim 24, wherein the elastic
material comprises one of silicone rubber and latex.

Claim 26 (Original): The sealing member according to claim 23, wherein the conical
section comprises a first portion having a first diameter disposed adjacent the seal ring and a
second portion having a second diameter less than the first diameter disposed opposite the
first portion, and wherein the height of the conical section is at least as large as the first
diameter before the instrument is disposed in the conical section.

Claim 27 (Original): The sealing member according to claim 26, wherein the height of the conical section is larger than the first diameter before the instrument is disposed in the conical section.

Claim 28 (Original): The sealing member according to claim 23, wherein the height of the conical section is larger than the diameter of the base of the conical section before the instrument is disposed in the conical section.

Claim 29 (Original): The sealing member according to claim 28, wherein the conical section comprises a first portion having a first diameter adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed opposite the first portion, and wherein the height of the conical section is larger than the first diameter before the instrument is disposed in the conical section.

Claim 30 (Original): A sealing member configured to form a gas tight seal with an instrument removably disposed in a surgical device, the seal comprising:

a seal ring configured to be connected to an interior of the surgical device;

a conical section connected to the seal ring; and

first and second elastic protrusions configured to contact one another to form the gas tight seal.

Claim 31 (Original): The sealing member according to claim 30, wherein one of the conical section and the protrusions comprises an elastic material.

Claim 32 (Original): The sealing member according to claim 31, wherein the elastic material comprises one of silicone rubber and latex.

Claim 33 (Original): The sealing member according to claim 30, wherein the first and second protrusions comprise flaps.

Claim 34 (Original): The sealing member according to claim 33, wherein the flaps are configured to be urged toward one another when stretched.

Claim 35 (Original): The sealing member according to claim 30, wherein the first and second protrusions comprises flat flaps configured to form the gas tight seal with the instrument when the instrument is disposed in the seal and configured to form the gas tight seal with one another when an instrument is not disposed in the seal.

Claim 36 (Original): The sealing member according to claim 35, further comprising: a neck disposed between the conical section and the protrusions, the neck configured to form the gas tight seal with the instrument disposed in the seal.

Claim 37 (Original): The sealing member according to claim 36, wherein the neck is configured to form the gas tight seal with the instrument having a diameter of between about 3 mm and about 12 mm disposed in the seal.

Claim 38 (Original): The sealing member according to claim 37, wherein the conical section comprises a first portion having a first diameter disposed adjacent the seal ring and a

second portion having a second diameter less than the first diameter disposed adjacent the neck.

Claim 39 (Original): The sealing member according to claim 30, wherein the protrusions define voids configured to connect with attachment portions of the surgical device.

Claim 40 (Original): A surgical device, comprising:
a handle configured to be gripped;
a cannula connected to the handle; and
means for forming a gas tight seal between an instrument removably disposed therein,
the means for forming the gas tight seal having a height at least as large as a diameter of a base of the means for forming the gas tight seal before disposing the instrument therein.

Claim 41 (Original): A surgical device, comprising:
a handle configured to be gripped;
a cannula connected to the handle; and
means for forming a gas tight seal between an instrument removably disposed therein
and for forming the gas tight seal between portions of the means for forming the gas tight seal when no instrument is disposed therein.

Claim 42 (Original): A method of sealing a surgical device, comprising:
forming a seal between an instrument and a sealing member, the sealing member having a height at least as large as a diameter of a base of the seal when the instrument is not disposed in the seal.

Claim 43 (Original): The method according to claim 42, further comprising:
disposing the sealing member in a handle of a trocar.

Claim 44 (Original): The method according to claim 42, wherein the instrument
comprises a penetrator.

Claim 45 (Original): A method of sealing a surgical device, comprising:
disposing an instrument in a conical member; and
forming a seal between protrusions connected to the conical member and the
instrument.

Claim 46 (Original): The method according to claim 45, wherein the protrusions
comprises flaps.

Claim 47 (Original): The method according to claim 46, further comprising:
disposing the conical member and the protrusions in a handle of a trocar.

Claim 48 (Original): The method according to claim 46, wherein the instrument
comprises a penetrator.

Claim 49 (Original): A method of sealing a surgical device, comprising:
disposing a sealing member in an interior of a handle; and
forming a gas tight seal with an instrument disposed in an opening of the sealing
member, the sealing member comprising a seal ring connected to the interior of the handle,

and a conical section configured to have the instrument disposed therein, the conical section connected to the seal ring and having a height at least as large as a diameter of a base of the conical section before disposing the instrument therein.

Claim 50 (Original): A method of sealing a surgical device, comprising:
disposing a sealing member in an interior of a handle; and
forming a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising a seal ring connected to the interior of the handle, a conical section configured to have the instrument disposed therein, the conical section connected to the seal ring, and first and second elastic protrusions configured to have the instrument disposed therein, the elastic protrusions configured to contact one another to form the gas tight seal.

Claim 51 (Original): A surgical device, comprising:
a handle configured to be gripped;
a cannula connected to the handle; and
a sealing member disposed in an interior of the handle and configured to form a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising:
a seal ring connected to the interior of the handle;
a first section connected to the seal ring; and
a second section connected to the first section and configured to have the instrument disposed therein.

Claim 52 (Original): The surgical device according to claim 51, wherein the first section comprises a bellows.

Claim 53 (Original): The surgical device according to claim 51, wherein the first section comprises a pleated section.

Claim 54 (Original): The surgical device according to claim 51, wherein the first section is configured to be extended along an axis of the sealing member.

Claim 55 (Original): The surgical device according to claim 51, wherein at least one of the first section and the second section comprises an elastic material.

Claim 56 (Original): The surgical device according to claim 55, wherein the elastic material comprises one of silicone rubber and latex.

Claim 57 (Original): The surgical device according to claim 51, further comprising:
an instrument removably disposed in the second section, the second section forming the gas tight seal with the instrument.

Claim 58 (Original): The surgical device according to claim 57, wherein the instrument comprises a penetrator.

Claim 59 (Original): The surgical device according to claim 51, further comprising:
a valve configured to form a gas tight seal when no instrument is disposed therein.

Claim 60 (Original): The surgical device according to claim 59, wherein the valve is configured to permit gas flow therethrough when the instrument is disposed therein.

Claim 61 (Original): The surgical device according to claim 59, wherein the valve comprises a one way valve.

Claim 62 (Original): The surgical device according to claim 59, wherein the valve comprises first and second protrusions configured to maintain the gas tight seal.

Claim 63 (Original): The surgical device according to claim 62, wherein the valve comprises a first cylindrical portion connected to the first and second protrusions.

Claim 64 (Original): A sealing assembly configured to form a gas tight seal with an instrument removably disposed in a device, the sealing assembly comprising:

- a seal ring configured to be connected to an interior of the device;

- a first section connected to the seal ring; and

- a second section connected to the first section, the second section having an opening formed therein and being configured to permit the instrument to be disposed therethrough.

Claim 65 (Original): The sealing assembly according to claim 64, wherein the first section comprises a bellows.

Claim 66 (Original): The sealing assembly according to claim 64, wherein the first section comprises a pleated section.

Claim 67 (Original): The sealing assembly according to claim 64, wherein the first section is configured to be extended along an axis of the sealing member.

Claim 68 (Original): The sealing assembly according to claim 64, wherein at least one of the first section and the second section comprises an elastic material.

Claim 69 (Original): The sealing assembly according to claim 68, wherein the elastic material comprises one of silicone rubber and latex.

Claim 70 (Original): The sealing assembly according to claim 64, further comprising: a valve configured to form a gas tight seal when no instrument is disposed therein.

Claim 71 (Original): The sealing assembly according to claim 70, wherein the valve is configured to permit gas flow therethrough when the instrument is disposed therein.

Claim 72 (Original): The sealing assembly according to claim 70, wherein the valve comprises a one way valve.

Claim 73 (Original): The sealing assembly according to claim 70, wherein the valve comprises first and second protrusions configured to maintain the gas tight seal.

Claim 74 (Original): The sealing assembly according to claim 73, wherein the valve comprises a first cylindrical portion connected to the first and second protrusions.

Claim 75 (Original): A method of sealing a device, comprising:

disposing a sealing member in an interior of the device, the sealing member having an opening therein and being configured to form a gas tight seal with an instrument disposed in the opening of the sealing member, the sealing member comprising a seal ring connected to the interior of the handle, a first section connected to the seal ring, and a second section connected to the first section and configured to have the instrument disposed therein.

Claim 76 (Original): The method according to claim 76, further comprising:

disposing a one way valve in an interior of the device, the valve configured to achieve a gas tight seal when no instrument is disposed in the valve.

Claim 77 (New): A surgical device, comprising:

a handle configured to be gripped;

a cannula connected to the handle; and

a sealing member disposed in an interior of the handle and configured to form a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising:

a seal ring connected to the interior of the handle; and

at least one conical section configured to have the instrument disposed therein, the conical section being connected to the seal ring and having an axial length dimension at least as large as a diameter of a base of the conical section before disposing the instrument therein.

Claim 78 (New): The surgical device according to claim 77, wherein the conical section comprises an elastic material.

Claim 79 (New): The surgical device according to claim 77, wherein the elastic material comprises one of silicone rubber and latex.

Claim 80 (New): The surgical device according to claim 77, wherein the conical section comprises a first portion having a first diameter disposed adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed opposite the first portion, and wherein the height of the conical section is at least as large as the first diameter before disposing the instrument in the conical seal.

Claim 81 (New): The surgical device according to claim 8, wherein the length dimension of the conical section is larger than the first diameter before disposing the instrument in the conical section.

Claim 82 (New): The surgical device according to claim 77, wherein the length dimension of the conical section is larger than the diameter of the base of the conical section before disposing the instrument in the conical section.

Claim 83 (New): The surgical device according to claim 82, wherein the conical section comprises a first portion having a first diameter adjacent the seal ring and a second portion having a second diameter less than the first diameter opposite the first portion, and wherein the length dimension of the conical section is larger than the first diameter before disposing the instrument in the conical section.

Claim 84 (New): The surgical device according to claim 83, wherein the conical section is configured to be everted when the instrument is moved in an axial direction.

Claim 85 (New): The surgical device according to claim 77, further comprising:
an instrument removably disposed in the conical section, the conical section forming
the gas tight seal with the instrument.

Claim 86 (New): The surgical device according to claim 85, wherein the instrument
comprises a penetrator.

Claim 87 (New): A surgical device, comprising:
a handle configured to be gripped;
a cannula connected to the handle; and
a sealing member disposed in an interior of the handle and configured to form a gas
tight seal with an instrument disposed in an opening of the sealing member, the sealing
member comprising:
a seal ring connected to the interior of the handle;
at least one conical section configured to have the instrument disposed therein, the
conical section connected to the seal ring; and
at least one elastic protrusion connected to said conical section and configured to have
the instrument disposed therein, the at least one elastic protrusion being configured to form a
gas tight seal.

Claim 88 (New): The surgical device according to claim 89, wherein one of the
conical section and at least one protrusion comprises an elastic material.

Claim 89 (New): The surgical device according to claim 88, wherein the elastic material comprises one of silicone rubber and latex.

Claim 90 (New): The surgical device according to claim 87, wherein the at least one protrusion comprises a plurality of flaps or a second conical section flaps.

Claim 91 (New): The surgical device according to claim 90, wherein the sealing member comprises a neck disposed between the conical section and the at least one protrusion on the second conical section, the neck configured to form the gas tight seal with the instrument disposed in the sealing member.

Claim 92 (New): The surgical device according to claim 91, wherein the neck is configured to form the gas tight seal with the instrument having a diameter of between about 3 mm and about 12 mm disposed in the sealing member.

Claim 93 (New): The surgical device according to claim 91, wherein the conical section comprises a first portion having a first diameter disposed adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed adjacent the neck.

Claim 94 (New): The surgical device according to claim 87, wherein the second portion is held in place by a securing member in the form of a seal ring.

Claim 95 (New): A surgical device, comprising:
a handle configured to be gripped;

a cannula connected to the handle; and

means for forming a gas tight seal between an instrument removably disposed therein, the means for forming the gas tight seal having a length dimension at least as large as a diameter of a base of the means for forming the gas tight seal before disposing the instrument therein.

Claim 96 (New): A method of sealing a surgical device, comprising:

forming a seal between an instrument and a sealing member, the sealing member being conically shaped in part having a length dimension along a longitudinal axis thereof at least as large as a diameter of a base of the seal when the instrument is not disposed in the seal.

Claim 97 (New): The method according to claim 96, further comprising:

disposing the sealing member in a handle of a trocar.

Claim 98 (New): The method according to claim 96, wherein the instrument comprises a penetrator.

Claim 99 (New): A method of sealing a surgical device, comprising:

disposing an instrument in an at least partially conical member; and
forming a seal between protrusions connected to the at least partially conical member and the instrument.

Claim 100 (New): The method according to claim 99, wherein the protrusions comprises flaps.

Claim 101 (New): The method according to claim 100, further comprising:
disposing the conical member and the protrusions in a handle of a trocar.

Claim 102 (New): The method according to claim 100, wherein the instrument
comprises a penetrator.

Claim 103 (New): A method of sealing a surgical device, comprising:
disposing a sealing member in an interior of a handle; and
forming a gas tight seal with an instrument disposed in an opening of the sealing
member, the sealing member comprising a seal ring connected to the interior of the handle,
and an at least partially conical section configured to have the instrument disposed therein,
the at least partially conical section being connected to the seal ring and having a length
dimension at least as large as a diameter of a base of the conical section before disposing the
instrument therein.

Claim 104 (New): A method of sealing a surgical device, comprising:
disposing a sealing member in an interior of a handle; and
forming a gas tight seal with an instrument disposed in an opening of the sealing
member, the sealing member comprising a seal ring connected to the interior of the handle,
an at least partially conical section configured to have the instrument disposed therein, the at
least partially conical section being connected to the seal ring, and an elastic protrusion
configured to have the instrument disposed therein, the elastic protrusion being configured to
contact one another to form the gas tight seal.

Claim 105 (New): A surgical device, comprising:

a handle configured to be gripped;

a cannula connected to the handle; and

a sealing member disposed in an interior of the handle and configured to form a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising:

a seal ring connected to the interior of the handle;

a first section connected to the seal ring; and

a second section connected to the first section and configured to have the instrument disposed therein.

Claim 106 (New): A surgical device, comprising:

a handle configured to be gripped;

a cannula connected to the handle; and

a sealing member disposed in an interior of the handle and configured to form a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising:

a seal ring connected to the interior of the handle; and

a conical section configured to have the instrument disposed therein, the conical section being connected to the seal ring and being elastically biased at a base portion of the conical section and having an opening formed therein through which the instrument is insertable therethrough.

Claim 107 (New): The surgical device according to claim 106, wherein the conical section has a height at least as large as an inner diameter of the conical section opposite the base portion.

Claim 108 (New): The surgical device according to claim 106, wherein the base portion is elastically sealed so as to be closed prior to insertion of the instrument.

Claim 109 (New): A method of sealing a surgical device, comprising:
forming a seal between an instrument and a sealing member, the sealing member comprising a conically shaped seal having a height at least as large as an inner diameter of the seal when the instrument is not positioned in the seal.

Claim 110 (New): The method according to claim 109, further comprising:
disposing the sealing member in a handle of a trocar.

Claim 111 (New): The method according to claim 109, wherein the instrument comprises a penetrator.

Claim 112 (New): A method of sealing a surgical device, comprising:
disposing an instrument in a conical seal member; and
forming a seal by elastically biasing an end portion of the conical seal member.